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Declaration

I, Michihiko Matsuba, President of Fukuyama Sangyo Honyaku Center, Ltd., of 16-3, 2-chome, Nogami-cho, Fukuyama, Japan, do solemnly and sincerely declare that I understand well both the Japanese and English languages and that the attached document in English is a full and faithful translation of the copy of Japanese Unexamined Utility Model No. Sho-61-000131 laid open on January 6, 1986.

A handwritten signature in black ink, appearing to read "m. matsuba", with a stylized flourish at the end.

Michihiko Matsuba

Fukuyama Sangyo Honyaku Center, Ltd.

CAMERA

Japanese Unexamined Utility Model No. Sho-61-000131

Laid-open on: January 6, 1986

Application No. Sho-59-82895

Filed on: June 6, 1984

Inventor: Shuichiro SAITO

Applicant: Canon Inc.

Patent Attorney: Hiroyuki NIWA

SPECIFICATION

1. TITLE OF THE UTILITY MODEL

CAMERA

2. WHAT IS CLAIMED IS;

1. A camera, wherein light, transmitted through a detachable lens, is made incident on a solid-state image pickup device via an optical low-pass filter, and an image pickup surface of the solid-state image pickup device is covered by the optical low-pass filter and thereby hermetically sealed by the optical low-pass filter.

(2) The camera according to Claim 1, wherein the optical low-pass filter comprises a quartz plate.

3. DETAILED DESCRIPTION OF THE UTILITY MODEL

[Technical Field]

The present utility model relates to a camera, with which an image pickup surface of a solid-state image pickup device is covered by an optical low-pass filter and hermetically sealed by an optical low-pass filter.

[Prior Art]

With a recently proposed camera using a solid-state image pickup device, an optical system is arranged as shown in FIG. 1. That is, the optical system is constituted of the solid-state image pickup device, including a chip 1a, an optical low-pass filter 1b, disposed so as to cover the chip 1a, a package 1c, and a protective glass 1e, disposed so as to cover an opening 1d of the package 1c, and an optical low-pass filter 2, spaced from a front surface of the solid-state image pickup device 1.

Because the solid-state image pickup device 1 is hermetically sealed by the protective glass 1e, oxygen, water, dust, etc., in air cannot enter inside the package 1c. Aluminum wiring portions on the chip 1a are thus prevented from changing, due to oxygen or water in air, to alumite and then to aluminum hydroxide or other remarkably readily ionized substance and dissolving in acid or alkali.

With the solid-state image pickup device 1 used in the present type of camera, because a light receiving portion is constituted of two-dimensionally positioned pixels and is

finite, moiré or aliasing tends to occur readily. Such phenomena are thus prevented by a quartz plate or other optical low-pass filter.

However, among cameras of the present type, those with which a lens is exchangeable are provided with an opening (lens mount) for mounting the lens onto a main camera unit. Thus when the lens mount is put in an open state at the time of lens exchange, dust, etc., may enter from the lens mount and become attached onto the protective glass 1e that is disposed while being spaced from the optical low-pass filter 2. Because an interval between the protective glass 1e and a surface of the chip 1a, that is, an image forming surface is narrow, the attached dust can become a shadow and be captured along with a subject image, and such influence of dust, etc., is especially prominent when an aperture is stopped down. Furthermore, because the optical low-pass filter 2 is disposed in front of the protective glass 1e, it is difficult to remove the dust, etc., once the dust, etc., becomes attached to the protective glass 1e.

Also, although there is a camera, with which, in order to prevent the entry of dust, etc., the lens mount is hermetically sealed with glass, etc., this camera is longer in flange focal distance than a normal camera and has a problem in that the main camera unit becomes thick.

[Object]

The present utility model has been made in view of the above problems of the conventional art, and an object thereof is to provide a camera, with which influence of dust, etc., entering from a lens mount, is eliminated, and an optical low-pass filter and a solid-state image pickup device are arranged as a unit.

[Embodiment]

An embodiment of the present utility model shall now be described based on the drawings.

In the drawings, reference numeral 10 denotes a lens mount, 11 denotes a quick-return mirror, 12 denotes a CCD (charge-coupled device) or other solid-state image pickup device, and 13 is a cylindrical holder, having one opening 13a closed by the solid-state image pickup device 12 and the other opening 13b closed by a quartz plate or other optical low-pass filter 14. The optical low-pass filter 14 is disposed while being spaced from the solid-state image pickup device 12. 15 is a mounting substrate for mounting the solid-state image pickup device 12 and is provided with mounting holes 15a, 15b, and 15c. Although not illustrated, a desired shutter mechanism is disposed at a desired location along an optical axis.

Arrows in the figure indicate subject light.

Because as mentioned above, the solid-state image pickup device 12, the optical low-pass filter 14, and the holder 13 are arranged as an integral and hermetically sealed unit, dust, etc., that enter from the lens mount 10 become attached only on a front surface of the optical low-pass filter 14 of the unit. Because the solid-state image pickup device 12 and the optical low-pass filter 14 are spaced apart, an image is not subject to influence of the dust, etc. Or, the influence of the dust is at least reduced in correspondence to a thickness of the optical low-pass filter.

The flange focal distance can thus be made short and the thickness of the main camera unit can be made thin in comparison to a camera with which the lens mount 10 is hermetically sealed by glass, etc.

[Effects]

As described above, with the present utility model, because the image pickup device is hermetically sealed using the optical low-pass filter, not only can the influence of dust, etc., on an image be prevented but the protective glass of the lens mount can be eliminated to enable the main camera unit to be made thin.

4. BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional view of an example of a conventional configuration of a solid-state image pickup device and an

optical low-pass filter, and FIG. 2 is an exploded perspective view of principal portions of camera to which the present utility model is applied.

12 ... solid-state image pickup device

14 ... optical low-pass filter